

VERMONT AGENCY OF AGRICULTURE

PLANT INDUSTRY DIVISION

COMPARATIVE SYMPTOMS OF BROOD DISEASES

| Feature | American foulbrood (<i>Paenibacillus larvae</i> bacterium) | Sacbrood (virus) | Chalkbrood (<i>Ascosphaera apis</i> -fungus) | European foulbrood (<i>Melissococcus pluton</i> - bacterium) |
|-------------------------------------|---|---|--|---|
| Appearance of brood comb | Sealed brood. Sealed brood sunken, dark in color, perforated. Sometimes cappings completely removed. | Sealed brood. Sealed brood perforated, or cappings completely removed, sometimes sunken. | Sealed and unsealed brood. Sealed brood becoming dark and sunken in heavy infections. Often cappings completely removed. | Unsealed brood. Patchy brood pattern. Sometimes sealed in advanced cases, perforated, sunken. |
| Age of dead brood | Elongated sealed larvae (prepupae) or young pupae. | Elongated sealed larvae (prepupae), but <u>not</u> pupae. | Elongated larvae (prepupae), before or after capping, but <u>not</u> pupae. | Curled (younger) larvae, including capped curled larvae in advanced cases. |
| Color of dead brood | Off-white, then coffee-brown, then dark brown to black. | Grey or yellow, then brown, sometimes with head-end grey. | Soft larvae vivid white with conspicuous yellow or dark grey head. Hard ■mummies■ either chalky-white or grey-black. | Off-white, yellowing to dark brown. Tracheae may be evident as lighter lines in larvae. |
| Consistency of dead brood | Soft, becoming sticky to ■ropy■; mucus-like. Rope snaps back. Very difficult to remove all larval contents from cell. | Plastic-like sac. Watery contents of sac often lumpy. May sometimes ■rope■ to small extent. Larvae can usually be removed from cell. | Initially soft, with furry surface filling cell swollen to hexagonal shape. Later shrinking to hard, chalky ■mummies■. | Watery or pasty, does not ■rope■. |
| Odor of dead brood | ■Dead animal like■; slight to pronounced glue odor. | None to slightly sour, like mucilage paste. | Not noticeable. | Sour, urine-like. |
| Scales (dried larval/pupal remains) | Flat in bottom side of cell. Adheres tightly to cell wall. Fine, threadlike tongue sticking up from front end of cell base if died in pupal form. | Dark brown. Easily removed in one piece from cell. No tongue present, but larval head may be curled upwards and resemble tongue. Lies flat on lower side of cell. Rough texture, brittle. | Creamy-white or grey-black ■mummies■ easily removed from cell. May also be present on floor board or at hive entrance. | Twisted in cell, corkscrew or half-moon shape. Easily removed from cell. Rubbery. No tongues present. |

For additional information, contact: Steve Parise, Apiculturist, Vermont Agency of Agriculture, 116 State St., Drawer 20, Montpelier, VT 05620. E-mail: steve.parise@state.vt.us. (From: Elimination Of American Foulbrood Without The Use Of Drugs, by M. Goodwin and C. Van Eaton. 1999. National Beekeepers Association of New Zealand, Inc.) (Rev. 4/07)

__ This leaflet is for informational purposes only. Reference to commercial products or trade names is made with the understanding that no discrimination is intended and no endorsement by the Vermont Department of Agriculture is implied.
